Cochrane Library

Cochrane Database of Systematic Reviews

Intermittent fasting for adults with overweight or obesity (Protocol)

Garegnani L, Oltra G, Saldías C, Escobar Liquitay CM, Madrid E

Garegnani L, Oltra G, Saldías C, Escobar Liquitay CM, Madrid E.
Intermittent fasting for adults with overweight or obesity (Protocol).
Cochrane Database of Systematic Reviews 2023, Issue 9. Art. No.: CD015610.
DOI: 10.1002/14651858.CD015610.

www.cochranelibrary.com

TABLE OF CONTENTS

[Intervention Protocol]

Intermittent fasting for adults with overweight or obesity

Luis Garegnani[1], Gisela Oltra[1], Cristina Saldías[2], Camila Micaela Escobar Liquitay[1], Eva Madrid[3]

[1]Research Department, Instituto Universitario del Hospital Italiano de Buenos Aires, Buenos Aires, Argentina. [2]Universidad de Valparaíso, Viña del Mar, Chile. [3]Interdisciplinary Centre for Health Studies CIESAL, Universidad de Valparaíso, Viña del Mar, Chile

Contact: Luis Garegnani, luisgaregnani@gmail.com.

Editorial group: Cochrane Metabolic and Endocrine Disorders Group.
Publication status and date: New, published in Issue 9, 2023.

Citation: Garegnani L, Oltra G, Saldías C, Escobar Liquitay CM, Madrid E. Intermittent fasting for adults with overweight or obesity (Protocol). *Cochrane Database of Systematic Reviews* 2023, Issue 9. Art. No.: CD015610. DOI: 10.1002/14651858.CD015610.

ABSTRACT

Objectives

This is a protocol for a Cochrane Review (intervention). The objectives are as follows:

To assess the effects of intermittent fasting for adults with overweight or obesity.

BACKGROUND

Description of the condition

Obesity is a serious medical condition characterised by excess adiposity, which is a source of extensive morbidity and mortality, due to several weight-related complications that may impair health (Garvey 2019). Obesity is a significant public health problem in modern society that has become a leading cause of death in developed countries (Fernandes 2007; Morales-Suarez-Varela 2021; Williams 2015a). Between 1980 and 2013, the prevalence rate of obesity or overweight increased by 27.5% for adults and by 47.1% for children worldwide, with a total of 2.1 billion individuals considered overweight or obese (Apovian 2016). According to the World Health Organization (WHO), obesity has tripled globally since 1975 (WHO 2021), with overweight and obesity levels across low- and middle-income countries (LMIC) approaching those found in higher-income countries (HIC), especially in the Middle East and North Africa, and in Latin America and the Caribbean (Popkin 2013). In HIC, obesity prevalence is highest among the poor, while overweight is prevalent across all wealth groups. In contrast, the prevalence of obesity and overweight in LMIC is higher among wealthier individuals than those who are poorer (Templin 2019). Higher overweight rates are seen in women compared with men, in urban dwellers compared with rural settings, and in older people compared with those who are younger; although the urban-rural overweight differential is shrinking in many countries (Ford 2017). A recent body mass index (BMI) analysis in the United States predicted that by 2030, one in two adults will be obese (Ward 2019).

Obesity is considered a risk factor for cardiovascular disease, type 2 diabetes, and cancer (Scully 2021). This leads to an average increase in annual healthcare costs of 36% and medication costs of 77% compared with a person of average weight (Apovian 2016), and imposes a large economic burden on the individual, families, and nations (Tremmel 2017). Besides excess healthcare expenditure, obesity also imposes costs due to lost productivity and foregone economic growth, due to lost work days, lower productivity at work, mortality, and permanent disability. In 2014, the global economic impact of obesity was estimated to be USD 2.0 trillion, or 2.8% of the global gross domestic product (Tremmel 2017).

Multiple factors influence the development of obesity, and include individual, social, environmental, and macro-level determinants (Noriea 2018). Individual determinants include biological, psychological, and behavioural factors, such as metabolic disorders, excessive calorie consumption, physical inactivity, and psychological factors (Pan 2021). Social determinants include the role of cultural and economic factors. Environmental determinants may consist of (but are not limited to) lack of or barriers to accessing healthy foods and safe walking areas within the neighbourhood. Macro-level determinants relate to the influence of media, access to health care, and government policies (Noriea 2018).

The diagnostic evaluation for obesity involves both an anthropometric component, e.g. BMI and waist circumference, and a clinical component that constitutes an assessment of the risk, presence, and severity of weight-related complications, indicating increased fat mass and the degree to which the excess adiposity is adversely affecting the health of individual (Garvey 2019). Epidemiologic studies define overweight and obesity using BMI (weight (kg)/height^2 (m)) to stratify obesity-related health risks at a population level. An adult with overweight is operationally defined as having a BMI between 25 kg/m^2 and 29.9 kg/m^2. An adult with obesity is defined as having a BMI exceeding 30 kg/m^2, which is further subclassified into class 1 obesity (BMI 30 kg/m^2 to 34.9 kg/m^2), class 2 obesity (BMI 35 kg/m^2 to 39.9 kg/m^2), and class 3 obesity (BMI ≥ 40 kg/m^2 (Wharton 2020)). The treatment of overweight and obesity involves weight management to achieve a reduction in health risks. This includes the promotion of weight loss, weight maintenance, and prevention of weight regain, along with physical activity, behavioural therapy, pharmacotherapy, surgery, and the prevention and treatment of potential comorbidity (Yumuk 2015).

Description of the intervention

Intermittent fasting involves eating patterns during which individuals take little or no energy for extended time periods alternated with periods of normal food intake (Correia 2020; Mattson 2017). This may imply consuming the entire daily caloric intake in a certain time window, e.g. eight hours, or it may imply eating one day and completely fasting the next day (Anton 2018). During the fasting period, the consumption of calories frequently varies from 0% to 35% of the regular caloric needs (Morales-Suarez-Varela 2021). Food consumption on non-fasting days can be either unrestricted, limited to a certain diet, or oriented to achieve a specific caloric intake of up to 125% of regular caloric needs (Anton 2018).

There are several different types of intermittent fasting (Allaf 2021).

- Time-restricted feeding (TRF): focusses on the duration of the fasting and eating windows within a 24-hour period; the daily food intake is restricted to a certain time window (usually ≤ 10 hours), and the overnight fast gets extended to at least 14 hours
- Periodic fasting (PF): fasting one to two days a week, with unrestricted consumption of food on the remaining five to six days a week (Anton 2018)
- Alternate-day fasting (ADF): a regimen of 24-hours of fasting on alternate days, with modified fasting or a restricted calorie intake on fasting days and regular eating on non-fasting days (Templeman 2020)
- Modified alternate-day fasting (MADF): a degree of calorie restriction or modified fasting during fasting periods, such as the 5:2 diet, during which drastic energy restriction is imposed for two days a week, and food consumption is unrestricted for the remaining five days. MADF has two key elements: (a) food restriction is applied on alternate days (nominally 24 hours, although practically more varied to accommodate sleep), and (b) any energy allowed during the fast is provided in a single meal, ensuring a tangible extension of the typical overnight fast (Templeman 2020).

Adverse effects of the intervention

Potential risks of Intermittent fasting include dehydration, hypoglycaemia, fatigue, weakness, dizziness, hypotension, insomnia, nausea, headache or migraines, presyncope or syncope, dyspepsia, malnutrition, and excessive hunger. Overeating is an expected consequence, although studies show that participants maintain a regulation of intake after the fasting period (Klempel 2010). Special considerations are needed in people with mental illness or undiagnosed eating disorders (Harding 2021). A dietitian

or nutritionist should be consulted to ensure that the nutritional needs of the person are being met.

Physicians' training in intermittent fasting is essential to provide adequate information, ongoing communication, support, and potential co-interventions (de Cabo 2019; Kang 2020).

How the intervention might work

Modifying diet and meal frequency by several fasting patterns can represent a new paradigm in today's medical approaches (Wilhelmi de Toledo 2020). Intermittent fasting may lead to various physiological beneficial effects, such as weight loss, improved insulin sensitivity, reduced inflammation, increased cell repair, improved cardiovascular and cognitive health, changes in hormone production, and enhanced immune system functionality (de Cabo 2019; Patterson 2017). However, the exact mechanisms for these effects are poorly understood (Li 2017).

The mechanism for weight loss is related to caloric restriction, increased fat metabolism, enhanced insulin sensitivity, and improved glucose metabolism. Glucose and fatty acids are essential sources of energy for metabolism. Glucose is used for fuel after meals, and fat is stored as triglycerides. During fasting periods, triglycerides are broken down into fatty acids and glycerol, which are then converted to ketone bodies by the liver, which provides a significant source of energy for many tissues during fasting, and promotes fat loss (de Cabo 2019), which may lead to positive changes in body composition (Martin 2016). Ketone bodies may contribute to the epigenetic control of gene expression, DNA repair, and genome stability (Di Francesco 2018), leading to cell restoration, which may positively affect cognition and survival. Intermittent fasting also restores a catabolic process that recycles nutrients in starvation, and maintains cellular energy homeostasis, enhancing the immune system's functionality (Stockman 2018).

Other proposed mechanisms of action are related to changes in endogenous circadian clocks, which regulate the production of metabolites and hormones, such as cortisol, insulin, and glucagon, which in turn, affect body weight and composition (Jamshed 2019). These changes may also positively effect the diversity of the intestinal microbiome (Manoogian 2017). In animal models, this promotes the browning of white adipose tissue and increases thermogenesis, and may contribute to weight loss (Li 2017).

Why it is important to do this review

As overweight and obesity rates increase, weight loss remains the primary strategy for reducing health risks and societal consequences associated with overweight and obesity (Williams 2015). Both observational studies and controlled trials have reported that a 5% weight loss produces clinically significant improvements in obesity-associated conditions (Mayer 2021). Several clinical practice guidelines and scientific societies state that current research related to intermittent fasting is limited, and recommend offering a comprehensive lifestyle intervention that combines behavioural, dietary, and physical activity components as a foundational element of any weight management intervention (Hall 2021; Mayer 2021; Wharton 2020).

The most common dietary interventions are calorie-restricted diets, including various permutations of energy restriction, macronutrients, foods, and dietary intake patterns, which achieve initial but often unsustained weight loss (Welton 2020). As a result, it becomes necessary to search for effective interventions that people can follow in the long term, and which provide permanent or sustained weight loss (Chao 2021).

Over recent years, intermittent fasting has gained popularity in publications, blogs, and news articles (Patterson 2017). Studies show inconsistent effects on health, highlighting the uncertainty faced by physicians and people with overweight or obesity when considering intermittent fasting as a feasible approach for sustained weight loss (Wilhelmi de Toledo 2020). Although a recent Cochrane Review by Allaf 2021 addressed the effects of intermittent fasting in preventing and reducing the risk of cardiovascular disease, most included studies recruited participants who were neither overweight nor obese, limiting their findings for this population. Other non-Cochrane systematic reviews assessed the effect of intermittent fasting in specific populations, such as people with diabetes and multiple sclerosis, and focused on surrogate outcomes, such as fasting insulin or systolic blood pressure, instead of major clinical outcomes, such as quality of life or participants' satisfaction (Borgundvaag 2021; Morales-Suarez-Varela 2021). The methodological limitations raise concerns about the generalisability and applicability of their findings in people with overweight and obesity.

OBJECTIVES

To assess the effects of intermittent fasting for adults with overweight or obesity.

METHODS

Criteria for considering studies for this review

Types of studies

We will include randomised controlled trials (RCTs) and cluster-randomised controlled trials (cluster-RCTs).

Following guidelines in Chapter 23 of the *Cochrane Handbook for Systematic Reviews of Interventions,* we will exclude cross-over trials, because they may have a potential withdrawal, rebound, or carry-over effect during or after the wash-out period (Higgins 2022b).

We will include studies reported as full text, those published as an abstract only, and unpublished data where it is possible to establish their eligibility for inclusion when data are limited.

Types of participants

We will include trials including participants aged 18 years or older with overweight or obesity.

If we identify studies in which only a subset of participants is relevant to this review, we will include these studies if data are available separately for the relevant subset, or if more than 80% of participants meet the inclusion criteria.

Diagnostic criteria for overweight and obesity

We will use body mass index (BMI) as the anthropometric measurement for the diagnosis of obesity and overweight. BMI provides the most used population-level measure of overweight and obesity, as it is the same for both sexes and for all adult ages

(WHO 2021). We will use these cutoff points (Garvey 2019; Wharton 2020);

- Overweight (BMI 25 kg/m^2 to 29.9 kg/m^2);
- Obesity (BMI ≥ 30 kg/m^2).

If included studies use different cutoff points to diagnose overweight and obesity, we will use the classification defined by the study authors.

Types of interventions

We will include trials comparing intermittent fasting alone or as part of a programme with multiple interventions (such as physical activity, behavioural therapy, etc) with placebo, no intervention, or other dietary interventions, e.g. Mediterranean diet, as specified by the study authors. We will include co-interventions, e.g. exercise, provided they are not part of the randomised treatment, and are comparable in both the intervention and comparator groups, to establish a fair comparison. If a study includes multiple arms, we will include any arm that meets the inclusion criteria for this review.

We plan to investigate the following comparisons of intervention versus control/comparator.

Intervention

- Intermittent fasting

Different types of intermittent fasting methods and details are described in the Description of the intervention.

We will exclude studies reporting religious fasts, as this does not have the goal of weight loss or improvement in metabolic variables (Trepanowski 2010).

Comparators

- Regular dietary advice: as defined by the study authors. This could include an eating plan emphasising fruits, vegetables, whole grains, seafood, caloric restriction, or any specific dietary advice for weight loss.
- No intervention or waiting list

Minimum duration of intervention

The minimum duration of the intervention will be four weeks, as it is the shortest timeframe described for dietary interventions (Ahern 2017; Chao 2021; Wu 2013).

Minimum duration of follow-up

The minimum duration of follow-up will be six months, which is referred to as a time point at which weight loss tends to reach a plateau (Ahern 2017; Chao 2021; Williams 2015; Wu 2013).

Types of outcome measures

We will not exclude a study if it fails to report more than one of our primary or secondary outcome measures of interest. We will only exclude studies if none of our outcomes of interest was measured, and provided there is evidence to support this, e.g. contact with trial authors, access to the original protocol, etc.

Primary outcomes

- Weight loss
- Quality of life
- Adverse events

Secondary outcomes

- Participant satisfaction
- Diabetes status
- Changes in lipid profile
- Overall measure of comorbidity

Method of outcome measurement

- Weight loss: defined as a categorical outcome, such as the proportion of participants achieving a 5% weight loss from baseline; or as a continuous outcome, such as the percentage of baseline weight lost, number of kilograms lost, or both (Mackenzie 2020)
- Quality of life: evaluated by a validated instrument, such as the Short-Form Health Survey (SF-36), the 12-item Short-Form Health Survey (SF-12) or EuroQol-5D (Fermont 2017; Mackenzie 2020)
- Adverse events: defined as the number of participants experiencing a worsening of a pre-existing medical condition, such as an undiagnosed eating disorder or other pre-existing medical conditions, or number of participants sustaining an injury during a physical activity session run by the weight management service (Mackenzie 2020)
- Participant satisfaction: assessed by mean Outcomes and Experiences Questionnaire (OEQ) score, adapted to suit weight management services, or mean NHS Friends and Family Test (FFT) score (Mackenzie 2020)
- Diabetes status: the percentage of participants with incident type 2 diabetes mellitus (based on self-report, electronic health records, or blood tests, such as a change in glycosylated haemoglobin levels or fasting glucose (Mackenzie 2020))
- Change in lipid profile: the mean change from baseline for total cholesterol levels, high-density lipoprotein levels, and triglycerides of participants, obtained via blood test (Mackenzie 2020)
- Overall measure of comorbidity: assessed with a validated tool that assesses the burden of comorbidity, such as the Edmonton Obesity Staging System (EOSS) score (Mackenzie 2020), the Charlson Comorbidity Index (Mackenzie 2020), the Elixhauser Comorbidity Index (Austin 2015), or any other tool reported by study authors

Timing of outcome measurement

We will consider outcomes measured up to and including 12 months after randomisation as short-term, and longer than 12 months as long-term. When multiple results are reported for each outcome, we will include the most extended follow-up in each category.

Minimally important difference

The minimal clinically important difference (MCID) may not be available for all outcomes considered, but we will state it when available. We will consider an absolute change of 5% in body weight as MCID (Jensen 2014; Mayer 2021; NICE 2022). For quality of life, we will consider a mean change of 0.03 points on the EuroQol-5D, and 5 points on the SF-12 as MCID (Rothberg 2015; Warkentin 2014).

Search methods for identification of studies

Electronic searches

We will search the following sources from the inception of each database to the date of search; we will place no restrictions on the language of publication:

- Cochrane Central Register of Controlled Trials (CENTRAL) via the Cochrane Library;
- MEDLINE Ovid; MEDLINE ALL (1946 to Daily Update);
- ClinicalTrials.gov (www.clinicaltrials.gov);
- World Health Organization International Clinical Trials Registry Platform (ICTRP; www.who.int/trialsearch).

We will not include Embase in our search, as RCTs indexed in Embase are now prospectively added to CENTRAL via a highly sensitive screening process (Cochrane 2020). For detailed search strategies, see Appendix 1. We will combine the MEDLINE search with the Cochrane highly sensitive search strategy for randomised trials: sensitivity and precision-maximising version (Lefebvre 2022).

Searching other resources

We will attempt to identify other potentially eligible studies or ancillary publications by searching the reference lists of included studies, and systematic reviews, meta-analyses, and health technology assessment reports identified during our searches. We will contact experts in the field to identify additional unpublished materials. We will also contact the authors of included studies to request additional information on the retrieved studies, and establish whether we may have missed further studies.

Data collection and analysis

Selection of studies

Two review authors (LG, GO) will independently screen the abstract, title, or both, of every record retrieved by the literature searches. We will obtain the full text of all potentially relevant records. We will resolve disagreements through consensus or by recourse to a third review author (EM). If we cannot resolve a disagreement, we will categorise the study as awaiting classification, and will contact the study authors for clarification. We will present a PRISMA flow diagram to show the process of study selection (Page 2021). We will list all articles excluded after full-text assessment in a characteristics of excluded studies table and will provide the reasons for exclusion (Page 2021). We will use Covidence software for study selection (Covidence).

Data extraction and management

For studies that fulfil our inclusion criteria, two review authors (LG, GO) will independently extract key information on participants, interventions, and comparators. We will extract the following data from reports:

- Methods
  - Study design
- Participants
  - Inclusion and exclusion criteria
  - Participant details, baseline demographics (number of males, mean age, age range, gender, diagnosis criteria, BMI, severity of the condition, dyslipidaemia, diabetes mellitus, inclusion criteria and exclusion criteria)
  - The number of participants by study and by study arm
- Interventions and comparisons, according to the Template for Intervention Description and Replication (TIDieR) checklist (Hoffmann 2014; Hoffmann 2017)
  - Name of the intervention
  - **Why**: rationale, theory or goal of the elements essential to the intervention
  - **What**: physical or informational materials used in the intervention; procedures, activities, or processes used in the intervention
  - **Who provided**: expertise, background and specific training given
  - **How**: describe modes of delivery
  - **Where**: describe the location where the intervention occurred, including infrastructure and features
  - **When/how much:** the number of times the intervention was delivered over a period of time
  - **Tailoring**: describe if personalisation or adaptations were planned
  - **Modifications:** during the course of the study
  - **How well**: measurements of adherence or fidelity
- Outcomes:
  - Definitions of relevant outcomes, method and timing of outcome measurement, as well as any relevant subgroups to the review
- Study dates (start date to end date; if dates are not available, we will report this)
- Study settings and country, language of publication, and study identifier
- Study funding sources
- Declarations of interest, by primary investigators

We will report these data in the characteristics of included studies table.

We will contact all authors of included studies to enquire whether they are willing to answer questions regarding their studies. We will document these communications. We will seek relevant missing information on the study from the primary study authors, if required.

Dealing with duplicate and companion publications

In the event of duplicate publications, companion documents, or multiple reports of a primary study, we will maximise the information yield by collating all available data, and we will use the most complete data set, aggregated across all known publications. We will list duplicate publications, companion documents, multiple reports of a primary study, and trial documents of included trials (such as trial registry information) as secondary references under the study ID of the included study. We will also list duplicate publications, companion documents, multiple reports of a study, and trial documents of excluded trials (such as trial registry information) as secondary references under the study ID of the excluded study.

Data from clinical trials registers

If data from included studies are available as study results in clinical trials registers, such as ClinicalTrials.gov or similar sources, we will make full use of this information and extract the data. If there is also

a full publication of the study, we will collate and critically appraise all available data. If the published and unpublished data do not match, we will ask the study authors for clarification. If we receive no response, we will present the discrepancies in the full-review report. If an included study is labelled as completed in a clinical trial register but no additional information (study results or publication, or both) is available, we will add this study to the characteristics of studies awaiting classification table.

Assessment of risk of bias in included studies

Two review authors (LG, GO) will independently assess the risk of bias for the results of the main outcomes (those included in the summary of findings table, see below) in each study, using the Cochrane RoB 2 tool (Higgins 2022a). We will resolve disagreements by consensus or by consulting a third review author (EM). If adequate information is unavailable from the publications, trial protocols, clinical study reports, or other sources, we will contact the study authors for more details on risk of bias items. We will assess the risk of bias according to the following domains, focusing on the effect of assignment to the intervention at baseline:

- The randomisation process;
- Deviations from intended interventions;
- Missing outcome data;
- Measurement of the outcome;
- Selection of the reported results.

We will collectively use the answers to signalling questions and supporting information to reach a domain-level judgement of low risk, some concerns, or high risk of bias. These domain-level judgements will inform our overall risk of bias judgement for a single outcome result as (a) low risk, if we judge all domains as low risk, (b) some concerns, if we judge one or more domains as giving some concerns, or (c) high risk, if we judge one or more domains as high risk, or if four domains give us some concerns. We will provide a quote from the study report, together with a justification for our judgement, in the risk of bias table. We will summarise the risk of bias judgements across different studies and domains for each outcome described. When judging the bias due to deviations from intended interventions, we will focus the analyses on the effect of assignment to intervention (Higgins 2022a). We will aim to source trial registries, protocols, and analysis plans to assess selective reporting. Where information on the risk of bias relates to unpublished data or correspondence with a trialist, we will note this in the risk of bias table.

When considering treatment effects, we will take into account the risk of bias for the studies that contribute to that outcome. We will construct summary assessments of the risk of bias for each important outcome (across domains), within and across studies (Higgins 2022a).

We will use the RoB 2 Excel tool to manage the data supporting the answers to the signalling questions and risk of bias judgements (available at www.riskofbias.info/). All these data will be publicly available, as supplementary material, in a public repository.

For cluster-RCTs, we will use the RoB 2 tool, plus a domain specific for cRCTs from the archived version of the tool (Domain 1b. Bias arising from the timing of identification and recruitment of participants; available at www.riskofbias.info), with its corresponding signalling questions, following the guidance in the *Cochrane Handbook,* Section 23.1.2 and Table 23.1.a (Higgins 2022b).

Measures of treatment effect

We will try to express dichotomous data as a risk ratio (RR) with 95% confidence intervals (CIs). For continuous outcomes measured on the same scale, e.g. weight loss in kg, we will estimate the intervention effect using the mean difference (MD) with 95% CIs. When data are pooled from studies that used different instruments to measure the same outcome, we plan to calculate standardised mean differences (SMDs) with 95% CIs. We will enter data presented as a scale with a consistent direction of effect, and multiply the SMD by a standard deviation that is representative of the pooled studies, e.g. the standard deviation (SD) from a well known scale used by several of the studies included in the analysis on which the result was based.

Unit of analysis issues

We will take into account the level at which randomisation occurred, and multiple observations for the same outcome. If more than one comparison from the same study is eligible for inclusion in the same meta-analysis, we will either combine groups to create a single pair-wise comparison, or appropriately reduce the sample size so that the same participants do not contribute data to the meta-analysis more than once (splitting the shared group into two or more groups). Although the latter approach offers some solutions for adjusting the precision of the comparison, it does not account for correlation arising from the inclusion of the same set of participants in multiple comparisons (Higgins 2022b).

We will attempt to re-analyse cluster-RCTs that have not appropriately adjusted for potential clustering of participants within clusters in their analyses. The variance of intervention effects will be inflated by a design effect. Calculation of a design effect involves the estimation of an intracluster correlation coefficient (ICC), specified in Chapter 23 of the *Cochrane Handbook* (Higgins 2022b). We will obtain estimates of ICCs by contacting study authors, or by imputing ICC values, using either estimates from other included studies that report ICCs or external estimates from empirical research. We plan to examine the impact of clustering by performing sensitivity analyses.

Dealing with missing data

If possible, we will obtain missing data from the authors of included studies. We will carefully evaluate important numerical data, such as screened, randomly assigned participants, and intention-to-treat, as-treated, and per-protocol populations in our risk of bias assessments. For this, we will investigate attrition rates, e.g. dropouts, losses to follow-up, and withdrawals, and critically appraise issues concerning missing data and the use of imputation methods, e.g. last observation carried forward. For our primary analyses, we will conduct available case analyses, considering these issues when assessing the risk of bias and the certainty of the evidence.

For studies in which the standard deviation (SD) of the outcome is not available at follow-up, or we cannot recreate it, we will standardise by the mean of the pooled baseline SD from studies that reported this information.

Assessment of heterogeneity

In the event of substantial clinical or methodological heterogeneity, we will not report study results as the pooled effect estimate in a meta-analysis.

We will visually examine the variability in point estimates and the overlap in confidence intervals. We will use the I^2 statistic to estimate the degree of heterogeneity present among the trials in each analysis. If we identify substantial unexplained heterogeneity, we will report it, and explore possible causes by prespecified subgroup analysis. We will use this rough guide to interpretation, outlined in Chapter 10 of the *Cochrane Handbook* (Higgins 2022b):

- 0% to 40%: might not be important;
- 30% to 60%: may represent moderate heterogeneity;
- 50% to 90%: may represent substantial heterogeneity;
- 75% to 100%: considerable heterogeneity.

We will avoid the use of absolute cutoff values, but interpret I^2 in relation to (a) the size and direction of effects, and (b) strength of evidence for heterogeneity, e.g. P value from the Chi^2 test, or CI for I^2.

Assessment of reporting biases

If we include 10 studies or more per comparison and outcome, we will use funnel plots to assess small-study effects. Several explanations may account for funnel plot asymmetry, including true heterogeneity of effect with respect to study size, poor methodological design (and hence bias of small studies), and selective non-reporting (Kirkham 2010). Therefore, we will interpret the results carefully (Sterne 2011).

Data synthesis

We plan to undertake a meta-analysis only if we judge the participants, interventions, comparisons, and outcomes to be sufficiently similar to ensure a result that is clinically meaningful. Unless good evidence shows homogeneous effects across studies of different methodological quality, we will primarily summarise data using a random-effects model (Wood 2008). We will interpret random-effects meta-analyses with due consideration for the whole distribution of effects, and present a confidence interval. We will perform statistical analyses according to the statistical guidelines presented in the *Cochrane Handbook* (Deeks 2022). When meta-analysis is not possible, we will conduct alternative forms of synthesis, including the summary of effect estimates, the combination of P values, and vote counting, based on the direction of effects, as described in Chapter 12 of the *Cochrane Handbook* (McKenzie 2022).

Subgroup analysis and investigation of heterogeneity

We expect the following characteristics to introduce clinical heterogeneity, and we plan to carry out subgroup analyses for these, including an investigation of interactions (Altman 2003).

- Low- and middle-income countries versus high-income countries, based on the World Bank classification (available at the World Bank website)
- Men versus women, considering trials conducted on one gender exclusively or with over 80% of participants representing a specific gender to establish the subgroups
- Overweight versus obesity
- Different types of intermittent fasting
- Delivery of the interventions: intermittent fasting alone versus intermittent fasting as a component of a programme with multiple interventions

We will use the formal test for subgroup interactions in Review Manager Web (RevMan Web (RevMan Web 2023)), acknowledging its limitations due to its observational nature and low power to detect differences with fewer than 10 studies per category (Higgins 2022b).

Sensitivity analysis

We plan to perform sensitivity analyses to explore the influence of the following factors (when applicable) on effect sizes.

- Restricting the analysis to studies at an overall low risk of bias
- Restricting the analysis to published studies (if there were any unpublished studies)
- Excluding studies with cluster randomisation

Summary of findings and assessment of the certainty of the evidence

We will present the overall certainty of the evidence for each outcome specified below, according to the GRADE approach, which takes into account issues related to internal validity (overall risk of bias, inconsistency, imprecision, publication bias) and external validity (directness of results). Two review authors (LG, GO) will independently rate the certainty of the evidence for each outcome. We will resolve any differences in assessment by discussion, or consulting a third review author (EM).

We will present a summary of the evidence in a summary of findings table. This will provide key information about the best estimate of the magnitude of effect, in relative terms and as absolute differences, for each relevant comparison of alternative management strategies; the numbers of participants and studies addressing each important outcome; and a rating of overall confidence in effect estimates for each outcome. We will create the summary of findings table using the methods described in the *Cochrane Handbook* (Schünemann 2022), and RevMan Web and GRADEpro GDT software (GRADEpro GDT; RevMan Web 2023).

If meta-analysis is not possible, we will present the results in a narrative format in the summary of findings table. We will justify all decisions to downgrade the certainty of the evidence by using informative footnotes and GRADE guidelines for informative statements (Santesso 2016; Santesso 2020).

We will create summary of findings tables for the following comparisons and outcomes:

- Comparisons:
  - Intermittent fasting versus regular dietary advice for weight loss
  - Intermittent fasting versus no intervention or waiting list
- Outcomes:
  - Weight loss (long-term)
  - Quality of life (long-term)
  - Adverse events (long-term)
  - Participants' satisfaction (long-term)

- Diabetes status (long-term)

ACKNOWLEDGEMENTS

Editorial and peer-reviewer contributions

Cochrane Metabolic and Endocrine Disorders Group supported the authors in the development of this Protocol.

The following people conducted the editorial process for this article:

· Sign-off Editor (final editorial decision): Brenda Bongaerts, Institute of General Practice, Medical Faculty of the Heinrich-Heine-University Düsseldorf, Düsseldorf, Germany

· Managing Editor (selected peer reviewers, collated peer-reviewer comments, provided editorial guidance to authors, edited the article): Juan Victor Ariel Franco, Institute of General Practice, Medical Faculty of the Heinrich-Heine-University Düsseldorf, Düsseldorf, Germany

· Copy Editor (copy-editing and production): Victoria Pennick, Cochrane Central Production Service

· Peer-reviewers (provided comments and recommended an editorial decision): Heidrun Janka, Cochrane Metabolic and Endocrine Disorders, Institute of General Practice (ifam), Medical Faculty of the Heinrich-Heine-University Düsseldorf, Düsseldorf, Germany; Suyan Tian, First Hospital of Jilin University; Wei Chen, Peking Union Medical College Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College; Rachida Roky, Department of Biology, Laboratory of Physiopathology, Molecular Genetics & Biotechnology, Faculty of Sciences Ain Chock, Health and Biotechnology Research Centre, Hassan II University of Casablanca, Casablanca, Morocco

REFERENCES

Additional references

Ahern 2017

Ahern AL, Wheeler GM, Aveyard P, Boyland EJ, Halford JCG, Mander AP, et al. Extended and standard duration weight-loss programme referrals for adults in primary care (WRAP): a randomised controlled trial. *Lancet* 2017;**389**(10085):2214-25.

Allaf 2021

Allaf M, Elghazaly H, Mohamed OG, Fareen MFK, Zaman S, Salmasi AM, et al. Intermittent fasting for the prevention of cardiovascular disease. *Cochrane Database of Systematic Reviews* 2021, Issue 1. Art. No: CD013496. [DOI: 10.1002/14651858.CD013496.pub2]

Altman 2003

Altman DG, Bland JM. Interaction revisited: the difference between two estimates. *BMJ* 2003;**326**(7382):219. [PMID: 12543843]

Anton 2018

Anton SD, Moehl K, Donahoo WT, Marosi K, Lee SA, Mainous AG 3rd, et al. Flipping the metabolic switch: understanding and applying the health benefits of fasting. *Obesity* 2018;**26**(2):254–68.

Apovian 2016

Apovian CM. Obesity: definition, comorbidities, causes, and burden. *The American Journal of Managed Care* 2016;**22**(7):s176-85.

Austin 2015

Austin SR, Wong YN, Uzzo RG, Beck JR, Egleston BL. Why summary comorbidity measures such as the Charlson Comorbidity Index and Elixhauser Score work. *Medical Care* 2015;**53**(9):e65-72.

Borgundvaag 2021

Borgundvaag E, Mak J, Kramer CK. Metabolic impact of intermittent fasting in patients with type 2 diabetes mellitus: a systematic review and meta-analysis of interventional studies. *The Journal of Clinical Endocrinology and Metabolism* 2021;**106**(3):902-11. [DOI: 10.1210/clinem/dgaa926] [PMID: 33319233]

Chao 2021

Chao AM, Quigley KM, Wadden TA. Dietary interventions for obesity: clinical and mechanistic findings. *The Journal of Clinical Investigation* 2021;**131**(1):e140065.

Cochrane 2020

Cochrane. How CENTRAL is created. www.cochranelibrary.com/central/central-creation (accessed 12 July 2023).

Correia 2020

Correia JM, Santos I, Pezarat-Correia P, Minderico C, Mendonca GV. Effects of intermittent fasting on specific exercise performance outcomes: a systematic review including meta-analysis. *Nutrients* 2020;**12**(5):1390.

Covidence [Computer program]

Covidence. Melbourne, Australia: Veritas Health Innovation. Available at www.covidence.org.

de Cabo 2019

de Cabo R, Mattson MP. Effects of intermittent fasting on health, aging, and disease. *The New England Journal of Medicine* 2019;**381**(26):2541–51.

Deeks 2022

Deeks JJ, Higgins JP, Altman DG, editor(s). Chapter 10: Analysing data and undertaking meta-analyses. In: Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, et al, editor(s). Cochrane Handbook for Systematic Reviews of Interventions Version 6.3 (updated February 2022). Cochrane, 2022. Available from www.training.cochrane.org/handbook.

Di Francesco 2018

Di Francesco A, Di Germanio C, Bernier M, de Cabo R. A time to fast. *Science* 2018;**362**(6416):770–5.

Fermont 2017

Fermont JM, Blazeby JM, Rogers CA, Wordsworth S, on behalf of the By-Band-Sleeve Study Management Group. The EQ-5D-5L is a valid approach to measure health related quality of life in patients undergoing bariatric surgery. *PLoS One* 2017;**12**(12):e0189190.

Fernandes 2007

Fernandes M, Atallah AN, Soares BGO, Humberto S, Guimarães S, Matos D, et al. Intragastric balloon for obesity. *Cochrane Database of Systematic Reviews* 2007, Issue 1. Art. No: CD004931. [DOI: 10.1002/14651858.CD004931.pub2]

Ford 2017

Ford ND, Patel SA, Narayan KM. Obesity in low- and middle-income countries: burden, drivers, and emerging challenges. *Annual Review of Public Health* 2017;**38**:145-64.

Garvey 2019

Garvey WT. Clinical definition of overweight and obesity. In: Gonzalez-Campoy J, Hurley D, Garvey W, editors(s). Bariatric Endocrinology. Switzerland: Springer, Cham, 2019. [DOI: 10.1007/978-3-319-95655-8_7]

GRADEpro GDT [Computer program]

GRADEpro GDT. Hamilton (ON): McMaster University (developed by Evidence Prime). Available at gradepro.org.

Hall 2021

Hall ME, Cohen JB, Ard JD, Egan BM, Hall JE, Lavie CJ, et al. Weight-loss strategies for prevention and treatment of hypertension: a scientific statement from the american heart association. *Hypertension* 2021;**78**(5):e38-e50. [DOI: 10.1161/HYP.0000000000000202]

Harding 2021

Harding S. Intermittent fasting: clinical considerations. *The Journal for Nurse Practitioners* 2021;**17**(5):545-8.

Higgins 2022a

Higgins JPT, Savović J, Page MJ, Elbers RG, Sterne JAC. Chapter 8: Assessing risk of bias in a randomized trial. In: Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, et al, editor(s). Cochrane Handbook for Systematic Reviews of Interventions Version 6.3 (updated February 2022). Cochrane, 2022. Available from www.training.cochrane.org/handbook.

Higgins 2022b

Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, et al, editor(s). Cochrane Handbook for Systematic Reviews of Interventions Version 6.3 (updated February 2022). Cochrane, 2022. Available from www.training.cochrane.org/handbook.

Hoffmann 2014

Hoffmann TC, Glasziou PP, Boutron I, Milne R, Perera R, Moher D, et al. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ* 2014;**348**:g1687.

Hoffmann 2017

Hoffmann TC, Oxman AD, Ioannidis JP, Moher D, Lasserson TJ, Tovey DI, et al. Enhancing the usability of systematic reviews by improving the consideration and description of interventions. *BMJ* 2017;**358**:j2998.

Jamshed 2019

Jamshed H, Beyl RA, Della Manna DL, Yang ES, Ravussin E, Peterson CM. Early time-restricted feeding improves 24-hour glucose levels and affects markers of the circadian clock, aging, and autophagy in humans. *Nutrients* 2019;**11**(6):1234.

Jensen 2014

Jensen MD, Ryan DH, Apovian CM, Ard JD, Comuzzie AG, Donato KA, et al. 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Obesity Society. *Circulation* 2014;**129**(25 Suppl 2):S102-38. [DOI: 10.1161/01.cir.0000437739.71477.ee]

Kang 2020

Kang SH, Park YS, Ahn SH, Kim HH. Intermittent fasting: current evidence in clinical practice. *Journal of Obesity & Metabolic Syndrome* 2020;**29**(2):81–3.

Kirkham 2010

Kirkham JJ, Dwan KM, Altman DG, Gamble C, Dodd S, Smyth R, et al. The impact of outcome reporting bias in randomised controlled trials on a cohort of systematic reviews. *BMJ* 2010;**340**:c365. [DOI: 10.1136/bmj.c365]

Klempel 2010

Klempel MC, Bhutani S, Fitzgibbon M, Freels S, Varady KA. Dietary and physical activity adaptations to alternate day modified fasting: implications for optimal weight loss. *Nutrition Journal* 2010;**3**(9):35.

Lefebvre 2022

Lefebvre C, Glanville J, Briscoe S, Littlewood A, Marshall C, Metzendorf MI, et al, Cochrane Information Retrieval Methods Group. Chapter 4: Searching for and selecting studies. In: Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, et al, editor(s). Cochrane Handbook for Systematic Reviews of Interventions Version 6.3 (updated February 2022). Cochrane, 2022. Available from www.training.cochrane.org/handbook.

Li 2017

Li G, Xie C, Lu S, Nichols RG, Tian Y, Li L, et al. Intermittent fasting promotes white adipose browning and decreases obesity by shaping the gut microbiota. *Cell Metabolism* 2017;**26**(4):672-85.

Mackenzie 2020

Mackenzie RM, Ells LJ, Simpson SA, Logue J. Core outcome set for behavioural weight management interventions for adults with overweight and obesity: standardised reporting of lifestyle weight management interventions to aid evaluation (STAR-LITE). *Obesity Reviews* 2020;**21**(2):e12961.

Manoogian 2017

Manoogian ENC, Panda S. Circadian rhythms, time-restricted feeding, and healthy aging. *Ageing Research Reviews* 2017;**39**:59-67.

Martin 2016

Martin CK, Bhapkar M, Pittas AG, Pieper CF, Das SK, Williamson DA, et al. Effect of calorie restriction on mood, quality of life, sleep, and sexual function in healthy Nonobese adults: the CALERIE 2 randomized clinical trial. *JAMA Internal Medicine* 2016;**176**(6):743–52.

Mattson 2017

Mattson MP, Longo VD, Harvie M. Impact of intermittent fasting on health and disease processes. *Ageing Research Reviews* 2017;**39**:46-58.

Mayer 2021

Mayer SB, Graybill S, Raffa SD, Tracy C, Gaar E, Wisbach G, et al. Synopsis of the 2020 U.S. VA/DoD clinical practice guideline for the management of adult overweight and obesity. *Military Medicine* 2021;**186**(9-10):884-96.

McKenzie 2022

McKenzie JE, Brennan SE. Chapter 12: Synthesizing and presenting findings using other methods. In: Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, et al, editor(s). Cochrane Handbook for Systematic Reviews of Interventions Version 6.3 (updated February 2022). Cochrane, 2022. Available from www.training.cochrane.org/handbook.

Morales-Suarez-Varela 2021

Morales-Suarez-Varela M, Collado Sánchez E, Peraita-Costa I, Llopis-Morales A, Soriano JM. Intermittent fasting and the possible benefits in obesity, diabetes, and multiple sclerosis: a systematic review of randomized clinical trials. *Nutrients* 2021;**13**(9):31792.

NICE 2022

Obesity: identification, assessment and management. Available at www.nice.org.uk/guidance/cg189 (accessed 12 July 2023).

Noriea 2018

Noriea AH, Patel FN, Werner DA, Peek ME. A narrative review of physician perspectives regarding the social and environmental determinants of obesity. *Current Diabetes Reports* 2018;**18**(5):24.

Page 2021

Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;**372**:n71. [DOI: 10.1136/bmj.n71] [PMID: 33782057]

Pan 2021

Pan XF, Wang L, Pan A. Epidemiology and determinants of obesity in China. *The Lancet. Diabetes and Endocrinology* 2021;**9**(6):373-92. [DOI: 10.1016/s2213-8587(21)00045-0]

Patterson 2017

Patterson RE, Sears DD. Metabolic effects of intermittent fasting. *Annual Review of Nutrition* 2017;**37**:371-93.

Popkin 2013

Popkin BM, Slining MM. New dynamics in global obesity facing low- and middle-income countries. *Obesity Reviews : An Official Journal of the International Association for the Study of Obesity* 2013;**14**(2):11-20.

RevMan Web 2023 [Computer program]

Review Manager Web (RevMan Web). Version 5.8. The Cochrane Collaboration, 2023. Available at revman.cochrane.org/.

Rothberg 2015

Rothberg AE. Weight loss ≥ 10% is required by the severely obese to achieve minimal clinically important differences in health-related quality of life. *Evidence-Based Medicine* 2015;**20**(2):69.

Santesso 2016

Santesso N, Carrasco-Labra A, Langendam M, Brignardello-Petersen R, Mustafa RA, Heus P, et al. Improving GRADE evidence tables Part 3: Detailed guidance for explanatory footnotes supports creating and understanding GRADE certainty in the evidence judgments. *Journal of Clinical Epidemiology* 2016;**74**:28-39. [DOI: 10.1016/j.jclinepi.2015.12.006] [PMID: 26796947]

Santesso 2020

Santesso N, Glenton C, Dahm P, Garner P, Akl EA, Alper B, et al. GRADE guidelines 26: Informative statements to communicate the findings of systematic reviews of interventions. *Journal of Clinical Epidemiology* 2020;**119**:126-135. [DOI: 10.1016/j.jclinepi.2019.10.014] [PMID: 31711912]

Schünemann 2022

Schünemann HJ, Higgins JPT, Vist GE, Glasziou P, Akl EA, Skoetz N, et al. Chapter 14: Completing 'Summary of findings' tables and grading the certainty of the evidence. In: Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, et al, editor(s), Cochrane Handbook for Systematic Reviews of Interventions Version 6.3 (updated February 2022). Cochrane, 2022. Available from www.training.cochrane.org/handbook.

Scully 2021

Scully T, Ettela A, LeRoith D, Gallagher EJ. Obesity, type 2 diabetes, and cancer risk. *Frontiers in Oncology* 2021;**10**:615375.

Sterne 2011

Sterne JA, Sutton AJ, Ioannidis JP, Terrin N, Jones DR, Lau J, et al. Recommendations for examining and interpreting funnel plot asymmetry in meta-analyses of randomised controlled trials. *BMJ* 2011;**343**:d4002.

Stockman 2018

Stockman MC, Thomas D, Burke J, Apovian CM. Intermittent fasting: is the wait worth the weight? *Current Obesity Reports* 2018;**7**(2):172-85.

Templeman 2020

Templeman I, Gonzalez JT, Thompson D, Betts JA. The role of intermittent fasting and meal timing in weight management and metabolic health. *The Proceedings of the Nutrition Society* 2020;**79**(1):76-87.

Templin 2019

Templin T, Cravo Oliveira Hashiguchi T, Thomson B, Dieleman J, Bendavid E. The overweight and obesity transition from the wealthy to the poor in low- and middle-income countries: a survey of household data from 103 countries. *PLoS Medicine* 2019;**16**(11):e1002968.

Tremmel 2017

Tremmel M, Gerdtham UG, Nilsson PM, Saha S. Economic burden of obesity: a systematic literature review. *International Journal of Environmental Research and Public Health* 2017;**14**(4):435.

Trepanowski 2010

Trepanowski JF, Bloomer RJ. The impact of religious fasting on human health. *Nutrition Journal* 2010;**9**:57.

Ward 2019

Ward ZJ, Bleich SN, Cradock AL, Barrett JL, Giles CM, Flax C, et al. Projected U.S. state-level prevalence of adult obesity and severe obesity. *The New England Journal of Medicine* 2019;**381**(25):2440-50.

Warkentin 2014

Warkentin LM, Majumdar SR, Johnson JA, Agborsangaya CB, Rueda-Clausen CF, Sharma AM, et al. Weight loss required by the severely obese to achieve clinically important differences in health-related quality of life: two-year prospective cohort study. *BMC Medicine* 2014;**12**:175.

Welton 2020

Welton S, Minty R, O'Driscoll T, Willms H, Poirier D, Madden S, et al. Intermittent fasting and weight loss: systematic review. *Canadian Family Physician: Médecin De Famille Canadien* 2020;**66**(2):117–25.

Wharton 2020

Wharton S, Lau DCW, Vallis M, Sharma AM, Biertho L, Campbell-Scherer D, et al. Obesity in adults: a clinical practice guideline.

Canadian Medical Association Journal 2020;**192**(31):E875-91. [DOI: 10.1503/cmaj.191707]

WHO 2021

Obesity and overweight. Available from www.who.int/news-room/fact-sheets/detail/obesity-and-overweight (accessed 12 July 2023).

Wilhelmi de Toledo 2020

Wilhelmi de Toledo F, Grundler F, Sirtori CR, Ruscica M. Unravelling the health effects of fasting: a long road from obesity treatment to healthy life span increase and improved cognition. *Annals of Medicine* 2020;**52**(5):147–61.

Williams 2015

Williams RL, Wood LG, Collins CE, Callister R. Effectiveness of weight loss interventions − is there a difference between men and women: a systematic review. *Obesity Reviews : An Official Journal of the International Association for the Study of Obesity* 2015;**16**(2):171-86.

Williams 2015a

Williams EP, Mesidor M, Winters K, Dubbert PM, Wyatt SB. Overweight and obesity: prevalence, consequences, and causes of a growing public health problem. *Current Obesity Reports* 2015;**4**(3):363-70.

Wood 2008

Wood L, Egger M, Gluud LL, Schulz KF, Jüni P, Altman DG, et al. Empirical evidence of bias in treatment effect estimates in controlled trials with different interventions and outcomes: meta-epidemiological study. *BMJ* 2008;**336**(7644):601-5.

Wu 2013

Wu H, Wylie-Rosett J, Qi Q. Dietary interventions for weight loss and maintenance: preference or genetic personalization? *Current Nutrition Reports* 2013;**2**:189–98.

Yumuk 2015

Yumuk V, Tsigos C, Fried M, Schindler K, Busetto L, Micic D, et al. European Guidelines for obesity management in adults. *Obesity Facts* 2015;**8**(6):402-24. [DOI: 10.1159/000442721]

APPENDICES

Appendix 1. Search strategies

Cochrane Central Register of Controlled Trials (CENTRAL; in the Cochrane Library)

#1 MeSH descriptor: [Overweight] explode all trees
#2 (Overweight* or over-weight* or overweight*):ti,ab,kw
#3 (Obes* or antiobes* or anti-obes*):ti,ab,kw
#4 MeSH descriptor: [Weight Loss] explode all trees
#5 (weight near/2 (Loss* or reduction*)):ti,ab,kw
#6 #1 OR #2 OR #3 OR #4 OR #5
#7 MeSH descriptor: [Fasting] explode all trees
#8 (Fasting* or “food abstinence”):ti,ab,kw
#9 (Time Restricted Feeding*):ti,ab,kw
#10 #7 OR #8 OR #9
#11 #6 AND #10

MEDLINE Ovid

Ovid MEDLINE(R) ALL <1946 to December 02, 2022>

1 exp Overweight/
2 (Overweight* or over-weight* or overweight*).tw.
3 (Obes* or antiobes* or anti-obes*).tw.
4 exp Weight Loss/
5 (weight adj2 (Loss* or reduction*)).tw.
6 1 or 2 or 3 or 4 or 5
7 exp Fasting/
8 (Fasting* or "food abstinence").tw.
9 Time Restricted Feeding*.tw.
10 7 or 8 or 9
11 6 and 10
12 randomized controlled trial.pt.
13 controlled clinical trial.pt.
14 randomized.ab.
15 placebo.ab.

(Continued)

16 drug therapy.fs.
17 randomly.ab.
18 trial.ab.
19 groups.ab.
20 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19
21 exp animals/ not humans.sh.
22 20 not 21
23 11 and 22

WHO ICTRP Search Portal (standard search)
(Overweight OR over-weight OR obesity OR obese OR weight) AND (fasting OR "Time Restricted Feeding" OR “food abstinence”)
ClinicalTrials.gov (advanced search)
Condition: Overweight OR over-weight OR obesity OR obese OR weight **Intervention**: fasting OR "Time Restricted Feeding" OR “food abstinence”

CONTRIBUTIONS OF AUTHORS

All review authors read and approved the final draft of the protocol.

LG, GO, CS, EM: drafted protocol; searched studies for the background section

CE, LG: developed search strategy

DECLARATIONS OF INTEREST

LG: none known
GO: none known
CS: none known
CE: none known
EM: none known

SOURCES OF SUPPORT

Internal sources

- Instituto Universitario del Hospital Italiano de Buenos Aires, Argentina

  In-kind support for the research team

External sources

- No sources of support provided

NOTES

We based parts of the Methods, as well as Appendix 1 of this Cochrane protocol, on a standard template established by the Cochrane Metabolic and Endocrine Disorders Group.